

Abstract

The subject invention provides unique biological alternatives for pest control. More specifically, the present invention relates to novel pesticidal proteins, novel sources of pesticidal proteins, polynucleotides that encode such toxins, and to methods of using these toxins to control insects and other plant pests. The subject invention relates to the surprising discovery that *Paenibacillus* species, and proteins therefrom, have toxicity to lepidopterans. There have been no known reports of a *Paenibacillus* species, strain, or protein having toxicity to lepidopterans. This is also the first known example of a *Paenibacillus* *Cry* protein that is toxic to lepidopterans. Furthermore, this is the first known report of *Paenibacillus* having toxin complex (TC)-like proteins. The DAS1529 isolate disclosed here is also the first known example of a natural bacterium that produces *both* a *Cry* toxin and TC proteins. The subject invention also relates to new classes of *Cry* and TC proteins that are pesticidally active.